WHAT IS CLAIMED IS:

1. A device for use in administering therapeutic gas to a spontaneously breathing, non-ventilated patient comprising:

A) a hollow entrainment cell having an inlet location and an outlet location with an outlet port fluidically connected to the interior of said entrainment cell for conducting therapeutic gas to a patient for administering therapeutic gas to the patient and a gas inlet port fluidically connected to a source of therapeutic gas, an air inlet port defined through a wall of said entrainment cell and fluidically connecting the interior of said entrainment cell with ambient air;

B) said entrainment cell being located remotely from a patient's nares to which gas from said entrainment cell is to be conducted for administration to the patient; and

C) said entrainment cell being sized to provide a low temporal latency for gases flowing through said entrainment cell.

2. The device defined in Claim 1 wherein said temporal latency is less than 100 milliseconds.

3. The device defined in Claim 1 wherein said entrainment cell is cylindrical with an inlet location wall and an outlet location wall and a side wall connecting said inlet location wall to said outlet location wall.

4. The device defined in Claim 3 wherein said air inlet port is

located in said inlet location wall.

5. The device defined in Claim 4 further including an inlet lumen connected to said inlet port and is located in said inlet location wall adjacent to said air inlet port.

6. The device defined in Claim 5 further including a flow baffle positioned internally of said entrainment cell between said inlet location wall and said outlet location wall.

7. The device defined in Claim 6 further including an inlet lumen fluidically connected to the inlet port of said entrainment cell and an inlet lumen extension extending from said inlet location wall past said baffle.

8. The device defined in Claim 3 further including a check valve on said air inlet port and oriented to permit air flow into said entrainment cell and to occlude said air inlet port against gas flow out of said entrainment cell.

9. The device defined in Claim 1 further including a second air inlet port defined through the side wall of said entrainment cell.

10. The device defined in Claim 1 further including a flow rate sensor located in said entrainment cell.

11. The device defined in Claim 1 further including a gas conduit fluidically connecting a second source of therapeutic gas to said entrainment cell.

12. A device for use in administering therapeutic gas to a spontaneously breathing, non-ventilated patient comprising:
A) a hollow entrainment cell having an inlet location and an outlet location with an outlet port fluidically connected to the interior of said entrainment cell for conducting therapeutic gas to a patient for administering therapeutic gas to the patient, and an air inlet port defined through a wall of said entrainment cell and fluidically connecting the interior of said entrainment cell with ambient air;
B) said entrainment cell being located remotely from a patient's nares;
C) said entrainment cell being sized to provide a low temporal latency for gases flowing through said entrainment cell;
D) a lumen fluidically connected to the patient's nares and conducting therapeutic gas past said entrainment cell to a location near the patient where therapeutic gas is mixed with entrained air prior to delivery to the patient whereby cannula latency is reduced.

13. The device defined in Claim 1 further including a mask which is positioned on the patient for delivering therapeutic gas to the patient, and fluid connections fluidically connecting said

mask with the outlet location of said entrainment cell.

14. The device defined in Claim 13 wherein the fluid connections fluidically connecting the mask to the outlet location of the entrainment cell include a lumen.

15. The device defined in Claim 1 wherein said entrainment cell has an internal volume of less than 10 cm^3.

16. The device defined in Claim 15 wherein said entrainment cell has a length dimension and a diameter dimension with the length dimension being greater the diameter dimension.

17. The device defined in Claim 1 further including a flow detector fluidically connected to the patient for detecting inspiration.

18. The device defined in Claim 1 further including an interlocking connector that interlocks the device to a gas controller, said interlocking connector including means to indicate to said controller when said interlocking connector is not properly engaged.

19. The device defined in Claim 1 further including an outlet gas port fluidically connected to an outlet lumen.

20. The device defined in Claim 1 further including a therapeutic

gas controller for controlling delivery of therapeutic gas to the patient according to patient inspiration.

21. The device defined in Claim 20 wherein said therapeutic gas controller includes a pressure sensor located to sense beginning of patient inspiration.

22. The device defined in Claim 1 wherein a total volume of gases are conducted into said entrainment cell via said gas inlet port and said air inlet port, said air inlet port and said gas outlet port being sized so the total volume of gases is greater than twenty percent of the total patient inspiratory flow on a breathing cycle.

23. The device defined in Claim 6 wherein said baffle includes a single hole through which gases pass.

24. The device defined in Claim 6 wherein said baffle includes a multiplicity of holes through which gases pass.

25. The device defined in Claim 5 further including a shaped orifice inside said entrainment cell.

26. The device defined in Claim 1 further including a connector for connecting the device to a gas controller, said connector having means to identify to the controller the type and characteristics of the device.

27. The device defined in Claim 1 wherein said entrainment cell is located remote from the patient.

28. The device defined in Claim 19 further including a plurality of outlet lumens.

29. A low dead volume pressure equalizing device for high purity gas circuits comprising: means for providing a flow versus pressure dead band, and means for providing zero flow in either direction at non-zero differential pressures.

30. The device defined in Claim 29 further including an inlet fitting to a gas circuit and means for connecting the device to said inlet fitting and further including a pin for minimizing dead space.

31. The device defined in Claim 30 further including a plunger, first and second sealing surfaces, opposed springs acting on said plunger, and an intermediate region of plunger travel during which flow will be prohibited.

32. The device defined in Claim 31 wherein said dead band is symmetric in differential pressure about zero with respect to non-zero flow in either direction.

33. The device defined in Claim 31 wherein characteristics of said springs determine whether said dead band is symmetric or

asymmetric in differential pressure about zero with respect to non-zero flow in each direction.

34. The device defined in Claim 33 further including safety means for preventing flow rates beyond a preset value in an event of otherwise unconstrained flow.

35. The device defined in Claim 34 wherein said safety means includes means for changing flow restriction based on flow rates.

36. A device for use in administering therapeutic gas to a spontaneously breathing, non-ventilated patient comprising:

A) a source of therapeutic gas;

B) a gas controller;

C) a cannula for administering therapeutic gas to a patient;

D) a conduit connecting said source of therapeutic gas to said cannula;

E) a flow sensor in said conduit and connected to said gas controller, said flow sensor being located remote from said gas controller and near the patient.

37. The device defined in Claim 16 wherein the length dimension of said entrainment cell is greater than three times the diameter dimension of said entrainment cell.

38. The device defined in Claim 19 wherein said outlet gas port has a flow dimension smaller than a flow dimension of the outlet

lumen.

39. The device defined in Claim 12 further including a gas inlet port fluidically connected to a source of therapeutic gas.

40. The device defined in Claim 29 wherein the pressure equalizing device is located inside an inlet fitting to a gas circuit.